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## (54) Safety razors

(57) A safety razor particularly suited for dry shaving has three or more blades 23 the cutting edges 23a of which are parallel and inclined at an

acute angle to the shaving direction.

The blades which are relatively small and identical to one another are mounted in a row along an elongate holder carried by a handle 21 extending in the shaving direction.

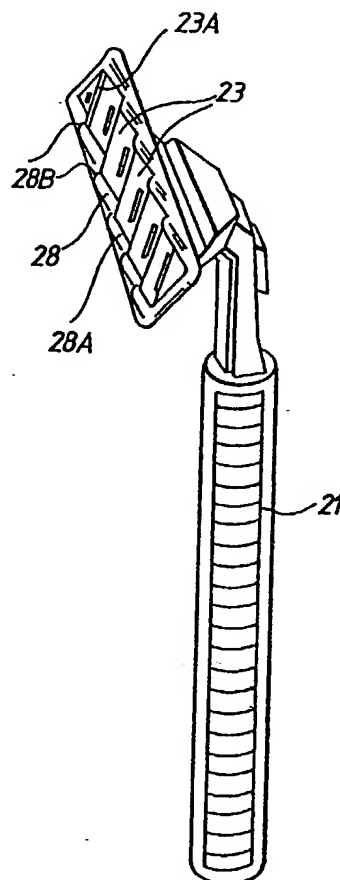


Fig.5.

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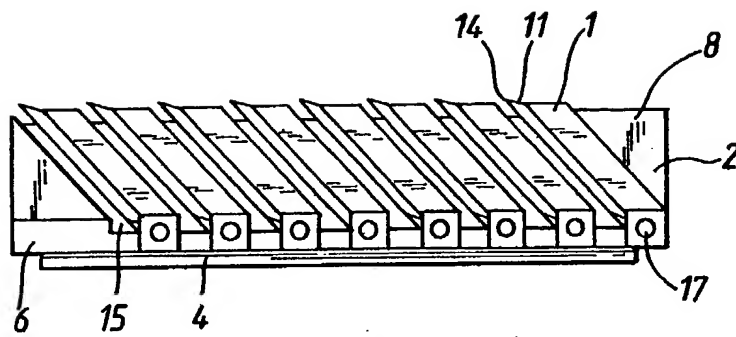


Fig.1.

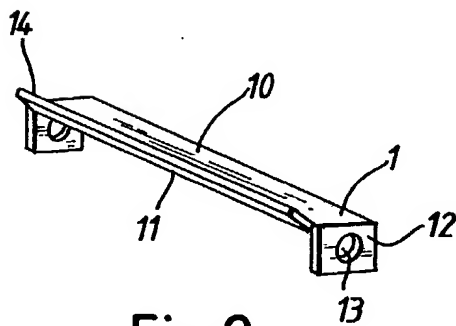


Fig.2.

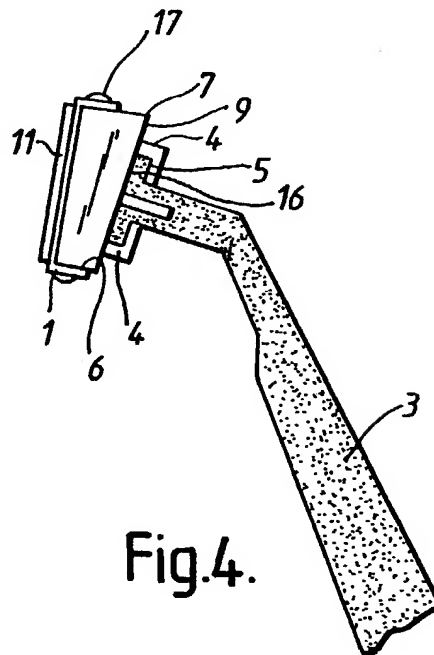


Fig.4.

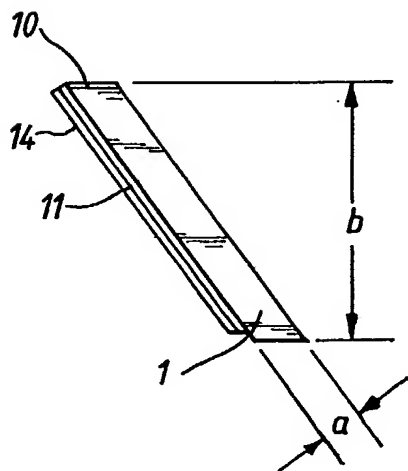


Fig.3.

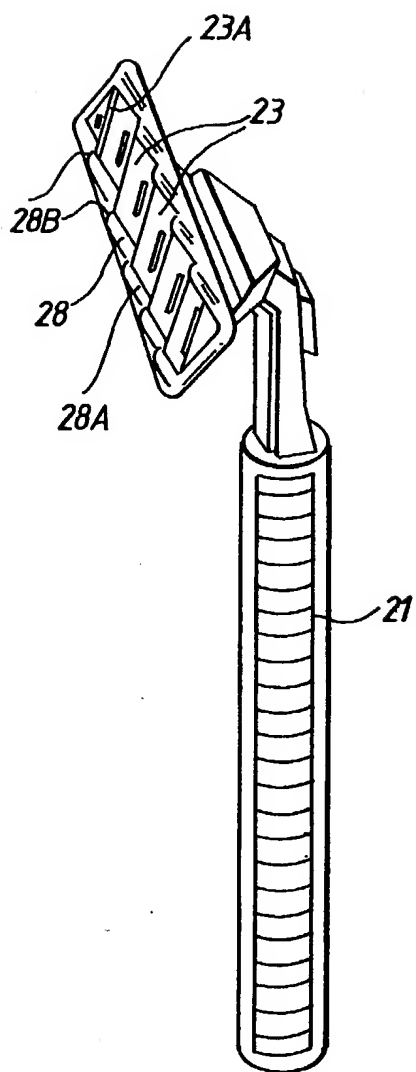


Fig. 5.

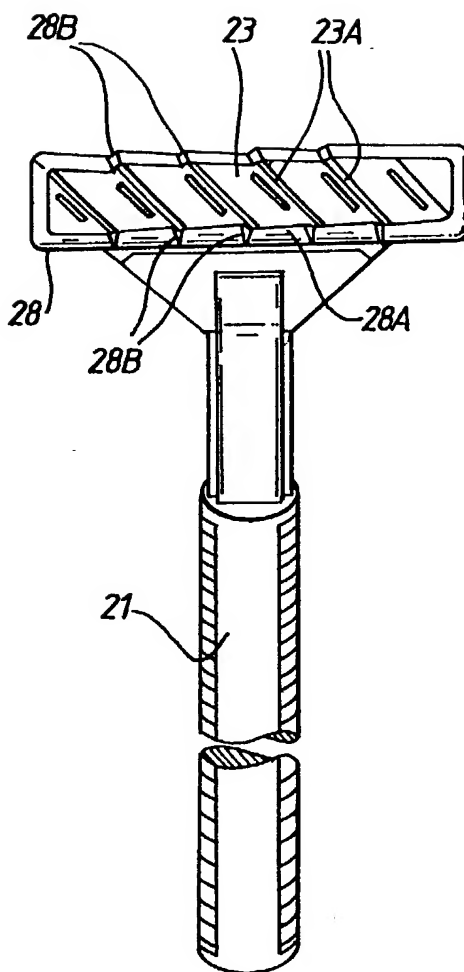


Fig. 6.

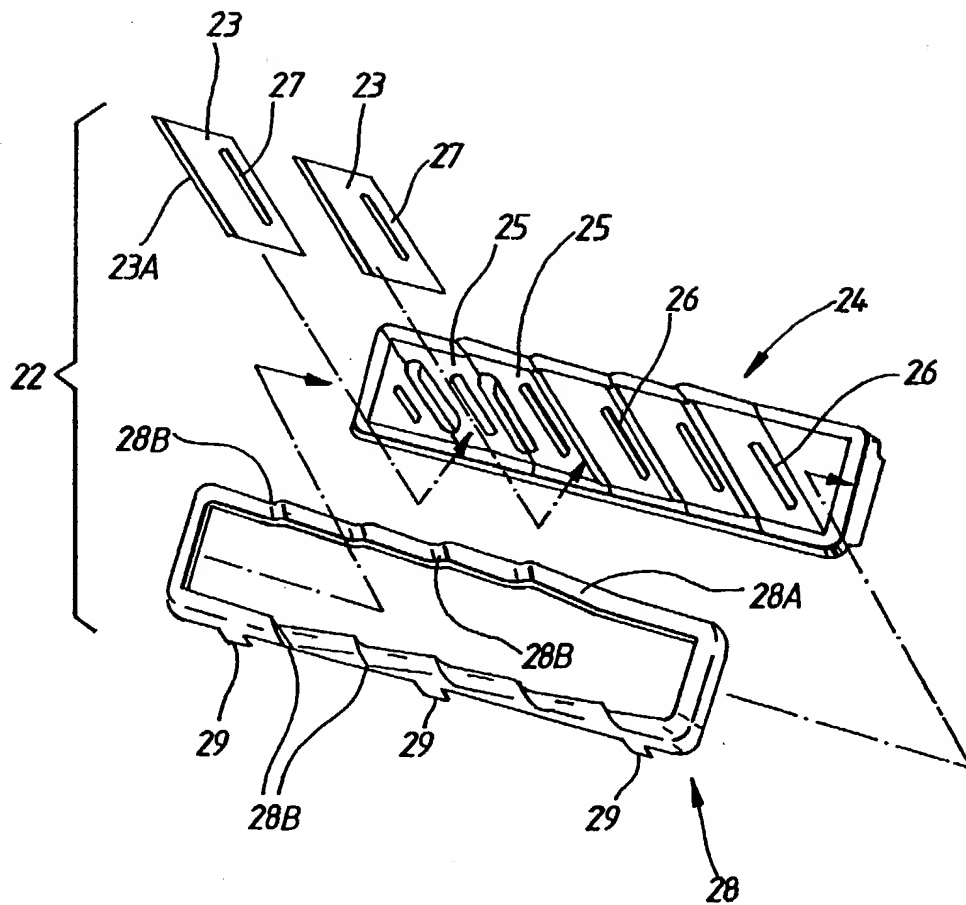


Fig.7.

# **SPECIFICATION** **Safety razor**

The present invention relates to a safety razor.

Basically, beard shaving involves two methods:

- 5 wet shaving and dry shaving. Wet shaving is a method of shaving the beard or moustache by applying shaving cream or other shaving lotions to the skin or portions to be shaven in order to facilitate the smooth movement of the blade. On
- 10 the other hand, dry shaving is a method of cutting the beard by pinching between the outer blade and the inner blade of an electric razor while the skin is left dry. Dry shaving is convenient as it does not require the use of shaving lotion, but stubble
- 15 equal in length to the thickness of the outer blade remain unshaven. Also, this method is more appropriately regarded as clipping the beard rather than shaving it, leaving an uneven stubble, making the skin appear bluish. On the other hand,
- 20 although wet shaving enables a clean shave, it has the shortcoming of requiring the trouble to use shaving lotion. Hence, there has been a demand for a device that is capable of achieving clean shaving while making the use of shaving lotion unnecessary.

One object of the present invention is to provide a safety razor capable of effecting clean shaving without using shaving cream or shaving lotion.

- 30 It is, well known, that a sharper and better cutting effect is obtained when the cutting edge tool is advanced while slicing back and forth through the object to be cut rather than advancing the cutting edge into the cutting object along the
- 35 direction perpendicular to the cutting object to be cut. For example, in cutting bread, the bread cannot be cut well by moving the knife down into the bread in a vertical direction, but it can be neatly cut when the knife is slid back and forth
- 40 during cutting. We have found that a beard can be cut better when the razor blade is moved down aslant to the beard instead perpendicularly thereto, since the resistance of the beard is reduced, making it possible to shave the beard
- 45 clean, even without shaving lotion.

In accordance with the present invention, we propose a safety razor having a plurality of blades which may be relatively small in size as compared with conventional blades and are preferably

- 50 identical in shape, and in which the cutting edges of the blades lie parallel to one another and extend in a direction inclined at an acute angle to the shaving direction.

Other features of the present invention are set

- 55 forth in the appendant claims.
- Embodiments of the invention will now be described by way of example with reference to the accompanying drawings, and in which:

- 60 one embodiment of safety razor according to the present invention;

Figure 2 is a perspective view of a single blade;

Figure 3 is a plan view of the blade shown in Figure 2;

- 65 Figure 4 is a partially omitted right side view of a safety razor;

Figure 5 is a perspective view of another embodiment of safety razor according to this invention;

- 70 Figure 6 is a front view of the safety razor shown in Figure 5; and

Figure 7 is an exploded perspective view of the blade holder of the razor shown in Figure 5.

- 75 With reference to Figures 1 to 4, the safety razor has a handle 3 which may be integral with but in this embodiment is detachable from a blade holder for eight identical blades 1. The holder 2 is secured to the handle, by inserting projections 16 formed at the head of the handle 3 into two
- 80 opposed grooves 5 defined by two L-shaped projections 4 extending longitudinally of the backside 9 of the blade holder 2.

- 85 The blade holder 2 has a flat elongate shape and is similar in size to the blade holder of a conventional safety razor. In cross-section the blade holder 2 is trapezoidal; the front side face 6 of the blade holder 2 corresponds to the top side of the trapezoid, while the rear side face 7 of the blade holder 2 corresponds to the bottom thereof.
- 90 The top surface 8 of the blade holder 2 is perpendicular to the front side face 6 as well as to the rear side face 7. Consequently, in the blade holder 2, the rear portion is thicker than the front portion. Then, to the backside 9 slanted in a
- 95 manner to face downward as it goes from the front portion to the rear portion, the handle 3 is attached. The rear portion is made thicker as mentioned above in the blade holder 2, because unless the rear portion is given the proper
- 100 thickness, exceeding the thickness of the front portion, the application of force becomes awkward when the safety razor is brought into with the skin.

- 105 The individual blades 1 each comprise a parallelogramic base plate 10, an edge portion 11 provided along one of the longitudinal sides of the base plate 10, and two foot portions 12 provided at both ends of the base plate 10, formed integrally with each other. The size of the base
- 110 plate 10 is considerably smaller than that of the replacement blade of an ordinary razor, and preferably, it is 3 mm in width a and 10 mm in height b. The edge portion 11 is inclined upwardly from the base plate 10. The blade 1 is mounted on
- 115 by laying the blade 1 across the blade holder 2 and fastening it at both ends with rivets 17 passing through holes 13 in the foot portions 12. Alternatively, or in addition, the blades may be secured in position by ultrasonic welding, or spot
- 120 welding when the blade holder 2 is formed of metal. The cutting edge 14 of each blade 1 is preferably inclined to the longitudinal axis of the blade holder 2 at an angle of 30 to 80 degrees. If this angle is less than 30 degrees, the effect of tilting the blade 1 is insignificant; while when it is
- 125 over 80 degrees, there is a tendency to cut the skin as the angle is too sharp. In the embodiment of Figure 1, eight identical blades are mounted on the blade holder 2 with the edges 14 thereof all

equal in height (that is to say, the edges 14 all lie in the same place parallel with the upper surface 8 of the blade holder 2).

In the upper surface 8 of the blade holder 2, a groove 15 is provided below the edge portion 11 of each blade 1, for the removal of shavings. Any shaven beard ends adhering to the edge portion 11 are pushed into the groove 15 when next the razor is used. Also, the groove 15 facilitates washing away residual beard ends when cleaning the razor.

Figure 5 to 7 illustrate another embodiment of safety razor according to this invention, in which, a handle 21 and blade assembly 22 are detachably connected together. The blade assembly 22 includes a blade holder 24 formed on its upper face, with seats or recesses 25 for receiving five flat blades 23, which are parallelogramic in shape. Each recess 25 is substantially the same shape as the blade 23, and the depth thereof gradually decreases from right to left (in the drawing). Further, the recesses 25 are so arranged in a row that the recess 25 and hence also the cutting edges 23A of blades 23 fitted in the recesses 25, parallel and inclined to the longitudinal axis of the blade holder 24.

A projection 26 in each recess 26 engages a slot 27 in the associated blade 23 to locate the blade in the desired position. Thus, because of the inclined bottom surface of the recess 25, each blade 23 seated in the recess 25 is inclined with the cutting edge 23A higher than the opposite edge thereof, and cutting edges 23A of all the blades 23 seated in the recess 25 are being set at the same level. The blades 23 are secured in position by a frame 28, fitted onto the blade holder 24 and having pawls 29, which engage with the back surface of the blade holder 24 so that the frame 28 is held fast. The inner edge portion 28A of the frame 28 has steps 28B complementary with the recesses 25 whereby the inner edge portion 28A bears upon both the upper and lower edge portions of the blades 23 to secure the blades 23.

As mentioned above, in the safety razor having more than three blades, according to the present invention the respective blades are formed relatively small in size and identical in shape. Also, the blades are mounted on the blade holder such that the respective blade edges are parallel to each other and are at the same height relative to the blade holder. Furthermore, each blade edge is inclined to the longitudinal axis of the blade holder. Consequently, when the safety razor is drawn over the skin along the vertical direction of the blade holder the cutting edges are presented at an angle to the beard, and slices through the beard to effect sharper cutting, so that the

resistance of the beard to cutting is much reduced. Consequently, the beard can be shaven without using shaving lotion, etc.

Moreover, if shaving lotion is used, far better cutting can be obtained as compared with conventional wet shaving.

It is known to use a single blade mounted aslant to the handle. However, since in the past conventional replacement blades have been used, the tilt angle could not be made sufficiently large to improve shaving. In contrast to conventional razors, the safety razor of the present invention places a plurality of blades which are relatively small in size and identical in shape in parallel rows, thus the angle of the blade edge relative to the handle can be increased, and also, the shaving width with each stroke can be kept to that of the conventional razor.

#### CLAIMS

1. A safety razor comprising: a handle carrying a blade holder and three or more blades mounted in the blade holder such that the cutting edges of the blades are parallel to each other, lie in the same plane, and are inclined in the longitudinal direction of the blade holder.
2. A safety razor according to claim 1, wherein a groove is formed in the blade holder under the cutting edge of each blade, for the removal of beard shavings.
3. A safety razor according to claim 1, wherein the blade holder and the handle are detachably connected by means of the reverse of the blade holder and on the head of the handle.
4. A safety razor according to claim 1, wherein the blade holder and handle are formed integrally.
5. A safety razor comprising: a handle; three or more blades which are relatively small in size, thin in thickness and are parallelogram in shape, respectively; and a blade holder provided having recesses affording inclined seats for the blades such that the cutting edge of each blade is higher than its opposite edge, and such that the blades are parallel to each other, equal in height, and inclined in the longitudinal direction of the blade holder.
6. A safety razor according to claim 5, further comprising a frame which is fitted onto said blade holder so as to hold the blades in the blade holder.
7. A safety razor constructed and arranged substantially as hereinbefore described with reference to and as illustrated in Figure 1 to 4 and Figures 5 to 7 of the accompanying drawings.
8. A safety razor having a plurality of blades and in which the cutting edges of the blades lie parallel to one another and extend in a direction inclined at an acute angle to the shaving direction.